

APPENDIX C

GLOSSARY

One of the objectives of the glossary is to promote common terminology for thin pavement surfacings. This is necessary because many terms describing types of thin pavement surfacings, and even the term *thin pavement surfacing*, do not have generally accepted definitions. To facilitate the introduction of a common terminology, the glossary also includes definition of terms that are not recommended as part of common terminology promoted by this best practice.

Asphalt binder – Asphalt material (such as asphalt cement, asphalt emulsion, or liquid asphalt) used to bind together aggregate particles or to bind them to the pavement surface.

Asphalt emulsion – A homogeneous mixture of asphalt cement (AC), water and emulsifier where microscopic droplets of asphalt are dispersed and suspended in water. Typically, asphalt cement makes up to 70 percent of the emulsion. Emulsions are used for many thin pavement surfaces such as surface treatment, micro-surfacing, slurry seal, and restorative seal. Different types of asphalt emulsions are defined in Table C.1.

Table C.1. Types of asphalt emulsion

		Type of asphalt emulsion	
Characteristic		Type	Abbreviation
Electrical charge of the emulsion		<i>Cationic</i> (C, or positive charge); <i>Anionic</i> (or negative charge); <i>Nonionic</i> (or neutral charge)	C ¹⁾
Setting time (time to revert to asphalt cement)		<i>Rapid Setting</i> (RS); <i>Medium Setting</i> (MS), <i>Slow Setting</i> (SS)	RS, MS, SS
Viscosity of emulsion ²⁾		<i>Low viscosity</i> , <i>High viscosity</i>	1, 2
Hardness of AC in emulsion ³⁾		<i>Hard</i>	h
Passing the flow test ⁴⁾		<i>High Float</i>	HF
Penetration in HF emulsion		<i>Low</i> , <i>Medium</i> , or <i>High Penetration</i>	100, 150, 250
Addition to AC in the emulsion	Polymers	<i>Polymer modified</i>	P
	Rubber (ground rubber tires)	<i>Rubberized</i>	No commonly used abbreviation

¹⁾ For anionic emulsions, the C designation is simply omitted. Nonionic emulsions are seldom used.

²⁾ Viscosity is a measure of the fluidity of an emulsion at specified temperatures. Applies only to RS, MS and SS emulsions. Performance-grading of the asphalt cement used for emulsion is not yet available.

³⁾ As measured by penetration test.

⁴⁾ ASTM D-139. Unless otherwise specified (by the HF designation), the emulsion is not high float.

Example: CRS-2P means *cationic rapid setting high viscosity polymerized asphalt emulsion*.

Cape seal – Application of slurry seal to a newly constructed surface treatment.

Dense-graded – Dense-graded (*or graded*) refers to the property of aggregate or to the property of materials utilizing such aggregate, e.g., dense-graded asphalt concrete. Dense-graded aggregate has aggregate particles that are fairly uniformly distributed throughout a full range of applicable sieve sizes. Refer also to the definition for open-graded.

Diamond grinding – Removing the surface of an asphalt pavement (or Portland concrete pavement) using a machine equipped with closely-spaced parallel diamond-tipped saw blades. The ridges left between the blades break off readily resulting in a texture depth¹ that is similar to that of new asphalt concrete. Some agencies accept the use of diamond grinding as a finished surface if it is used to improve smoothness of newly constructed asphalt concrete pavements.

Fog seal – See *restorative seal*.

HMAC – Hot Mix Asphalt Concrete

Hot-in-place recycling – A paving process that involves softening of the existing asphalt surface with heat, mechanically removing the surface material and mixing it on the road (in-place) with a recycling agent and, if required, with aggregate or beneficiating hot mix, at temperatures normally associated with hot-mix paving. Hot-in-place recycling qualifies, as a thin pavement surfacing if the total depth of the recycled layer and the additional layer used to protect the recycled layer is less than 40 mm.

Hot-in-place recycling with an integral overlay – Hot-in-place recycling with the addition of a thin layer of hot mix (on the top of the recycled layer) during the recycling operation. Hot-in-place recycling with an integral overlay qualifies as a thin pavement surfacing if the total depth of the recycled and new layers is less than 40 mm.

Liquid asphalt – Asphalt cement which has been modified by blending it with petroleum solvents (kerosene, diesel fuel) to be liquid at room temperature. Liquid asphalt is also called *cut-back*. The use of liquid asphalts is minor due to environmental concerns and the high cost of solvents.

Micro-milling – Removal of the surface of an asphalt concrete pavement (or Portland cement concrete pavement) by a self-propelled guided unit equipped with a helical cutting drum with carbide-tipped tools. Typically, the depth of micro-milling is up to 15 mm and results in a surface texture depth of about 1 mm.

Micro-surfacing – An unheated mixture of polymer-modified asphalt emulsion, high-quality frictional aggregate, mineral filler, water, and other additives, mixed and uniformly spread over the pavement surface as a slurry. The fundamental difference between micro-surfacing and a slurry seal is in the aggregate used to produce the slurry. Aggregate used for micro-surfacing has typically larger particles than the aggregate used

¹ Texture depth of the pavement surface is typically measured by the sand patch test (ASTM E965). The test involves taking a known volume of artificial sand (glass beads) and spreading it over the pavement surface until all depressions are filled to the peaks. The ratio of volume of sand to the area covered by the sand is the surface texture depth. Typical hot mix AC has a texture depth of about .4 mm or less.

for a slurry seal. The particles are 100 percent crushed, interlock, and produce a strong stone skeleton.

Milling – Removal of asphalt or Portland cement materials from pavements by a self-propelled unit having a cutting drum equipped with carbide-tipped tools.

Open-graded – Refers to the property of aggregate or to the property of materials utilizing such aggregate, e.g., open-graded friction course. Open-graded aggregate has similar-size aggregate particles and thus a large amount of voids between the particles. Refer also to the definition for dense-graded.

Preventive maintenance – A planned strategy of cost-effective treatments. There is a difference between preventive maintenance (a strategy) and preventive maintenance treatment (an action).

Preventive maintenance treatment – A treatment performed to prevent premature deterioration of the pavement, or to retard the progress of pavement defects. The objective is to slow down the rate of pavement deterioration and cost effectively increase the useful life of the pavement.

Precision milling – Removal of the surface of an asphalt concrete (or Portland cement concrete) pavement by a self-propelled unit having a cutting drum equipped with closely spaced carbide-tipped tools. Typically, the depth of precision milling is up to 25 mm and results in a surface texture depth of about 5 mm.

Recycling agent – Bituminous material added to reclaimed asphalt concrete material to improve binder deficiencies and to restore aged binder to desired specifications. Also called *rejuvenating agent* or *rejuvenator*.

Surface or Restorative seal – An application of a bituminous material to the surface of asphalt concrete pavement. Restorative seals are also referred to as rejuvenators or fog seals. Some agencies or suppliers recommend light sanding after the application of restorative seals (about one kg of sand per square meter).

Scrub seal – Application of asphalt binder to the pavement surface followed by the broom scrubbing of the binder into cracks and voids, and sanding. See also the definition of surface treatment, Table C-2.

Slurry seal – An unheated mixture of emulsion, graded fine aggregate, mineral filler, water, and other additives, mixed and uniformly spread over the pavement surface as a slurry. Slurry seal is also referred to as quickset slurry seal or polymer-modified quickset slurry seal, emulsified asphalt slurry seal, and thin cold-mix seal. Slurry seal is similar to micro-surfacing, but lacks the interlocking aggregate skeleton formed by crushed aggregate particles. Also, slurry seal emulsion may not be polymer-modified.

Surface abrasion – A process of abrading pavement surface to reduce roughness or improve pavement friction, resulting in the surface that can be used as a driving surface. Surface abrasion includes diamond grinding, micro-milling, precision milling, and other techniques.

Surface Treatment – An application of asphalt binder, immediately followed by an application of cover aggregate, to any type of pavement surface. Surface treatment is also called *bituminous surface treatment* or *asphalt surface treatment* or a chip seal. There are different types of surface treatments depending on the type of cover aggregate and the number of applications as summarized in Table C.2.

Table C.2. Terms used to describe different types of surface treatments.

Type of application	Aggregate Gradation		
	Open-graded (one size)	Dense-graded (different sizes)	Sand
One application of binder and one application of cover aggregate	Chip seal or Single chip seal	Surface treatment or Single surface treatment	Sand seal Scrub seal
Two applications of binder and two application of cover aggregate	Double chip seal	Double surface treatment	Not used

Tack coat – Application of bituminous material, typically asphalt emulsion diluted by water, to the surface of asphalt concrete (or Portland concrete) layer. It is used to improve a bond between the existing surface and the overlying course. A tack coat applied on a granular surface is called *prime coat*.

Thin (asphalt concrete) overlays – Asphalt concrete overlays less than 40 mm thick. Overlays that are less than 20 mm thick are commonly called **ultra-thin (asphalt concrete) overlays**.

Thin pavement surfacing – A pavement surface layer or treatment that is less than 40 mm thick.